NWX NASA JPL AUDIO CORE

Moderator: Mr. Michael Greene
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8:00 pm CT

Coordinator: Welcome and thank you for standing by. At this time all participants are in a listen only mode until the question and answer session of today's conference. At that time you may press Star 1 on your touch-tone phone to ask a question. I'd like to inform all parties that today's conference is being recorded, if you have any objections you may disconnect at this time. I would now like to turn the call over to Mr. (David Prosper) (Night Sky Network), thank you, you may begin.

(David Prosper): Thanks (Amber) hi everyone, we're glad to join you here from the (Night Sky Network) Headquarters at the Astronomical Society of the Pacific in San Francisco California. I'm very excited to present this teleconference with our guest speaker, (Connie Walker) from the Globe at Night Program. (Connie) and the Globe at Night team have joined us in the past and we're excited to hear about their expanded program for this year, including new Smart Phone apps and monthly sky monitoring events.

Now before we get started, I just want to make sure that you can all view the presentation slides. If you don't have the slides up in front of you yet, you can download them at astroscociety.org/nsntelecon and we have both Power Point and very recently updated PDF file thanks to (Connie) and if you have any problems along the way please email us at nightskyinfoastrosociety.org. Now for a brief minute I would like just hear from the folks joining us tonight.

I'd like to open up the lines and if you could just give us your name and tells us where you're calling from and what club you're with we'll have an idea of who's listening in.

(Stewart Myers): This is (Stewart Myers) Amateur Astronomers Inc. in New Jersey.

(Brian Mercer): This is (Brian Mercer) of Jackson, Michigan.

(Mike McCabe): This is (Mike McCabe) from Fountain, Massachusetts.

(Geraldine Ramirez): This is (Geraldine Ramirez).

(Jeremy Valasco): This is (Jeremy Valasco) I'm in the same club as (Mike) Society of Southern New England calling from Massachusetts.

(Steven Boss): This is (Steven Boss) calling from Atlanta Georgia I'm with Charlie Elliott Astronomy.

(Willie Yee): This is (Willie Yee) from Mid-Hudson Valley New York, Mid-Hudson Astronomical Association.

(John Gallagher): (John Gallagher) from the land of paradise, Hawaiian Astronomical Society.

(Bob Young): This is (Bob Young) from the Astronomical Society of Harrisburg.

(Bobbitt Dairy): (Bobbitt Dairy) from Booker, Texas, Star Creek Astronomical Society.

(Dale Rama): (Dale Rama) with Charlie Elliott Astronomy.

(Eileen Drewvosky): (Eileen Drewvosky) from Norman North Astronomy Club and Oklahoma City Astronomy Club in Oklahoma.

Woman: Hi (Connie).

((Crosstalk))

Man: In Prescott Arizona.

(Mark Young): (Mark Young) St Louis Astronomical Society.

(Marie Lot): (Marie Lot) Atlanta Georgia Charlie Elliott Astronomy.

(John Bunion): (John Bunion) from the Grants Pass Astronomers in Oregon.

(Ginny Raniham): (Ginny Raniham) amateur telescope maker from Boston.

(George Normanden): Hi (George Normanden) from Copernicus Astro Society in Vestal New York.

(Geraline Ramirez): (Geraline Ramirez) Antis Astronomical Observers out of Wichita Kansas.

(Christian Bergerman): (Christian Bergerman) Okalahoma City Astronomy Club.

Man: About 30 clubs on here so far.

(David Prosper): All right we'll just wrap it up now. Thank you all for chiming in, it's great to hear from you all and actually hear your real voices, I mostly just get this interactive via email so this is great. Now we're going to start our official welcome's here. If this is your first teleconference with us, welcome just

follow along with the slides and there'll be time for a brief Q&A at the end of the talk.

Also stick around for a minute after the presentation and Q&A as we'll be giving away a prize. Our winner will receive a signed copy of How it Began by Christin Pey, courtesy of the Astronomical Society of the Pacific and Norton Books and for one brief minute we're going to give you some of the latest Night Sky Network news for all of our members out here.

We are excited to announce that your 2014 award pins have arrived and we are shipping them this week, so keep your eyes peeled. And speaking of shipping we're also shipping out the latest run of tool kits to qualifying clubs as well. Remember not only schedule your events in a Night Sky network public calendar but also to log those events to qualify. We're hoping to make it easier for you to log your events and more with some upcoming updates to the Night Sky Network page, including mobile friendly interfaces and more.

The actual details of this will be headed to your club shortly and right now it is my great pleasure to introduce our speaker (Connie Walker) from Globe at Night, (Connie) is a scientist.

(Connie Walker): Hello.

(David Prosper): Hi there, (Connie) is a scientist at the National Optical Astronomy Observatory in Tucson Arizona where she spends her time training teachers, designing Astronomy curriculum and spear heading the Globe at Night Program. We haven't heard from here in a few years and we look forward to hearing all about the updates of this program. (Connie) has received many awards honoring her work in Astronomy education including having an asteroid named after her, Asteroid 29292 Connie Walker and for her efforts in

bringing Dark Sky awareness to the public, (Connie) won the International Dark Sky Associations Hogue Robinson Award in 2011 and we're happy to have her expertise as she serves on the Board of Directors here at the Astronomical Society of the Pacific as the Board Vice President and this evening we are honored to have her join us to share the latest news about Globe at Night, welcome (Connie) and take it away.

(Connie Walker): Well thank you (David) the honor is actually all mine and I can't stress enough how important I think having these astronomy clubs and all the members that are out there and all they do for the profession of Astronomy. I want to thank them deeply, especially with their help in the International Year of Astronomy. We really could not have done all the events that were planned for IYA without them, so my thanks goes to them very much.

So I'm here tonight to talk about something that's near and dear to my heart. That's the Globe at Night Program which is now starting its ninth year and it's growing every single year and again a lot of that is due to the participation of the various amateur astronomers across the world. We've had participation from 115 different countries all over the world and we're approaching 100,000 data points and maybe you will be one of the 100,000 data point who knows so keep contributing those measurements and we'll be shortly approaching that. I bet you anything it could be as soon as at the end of this first campaign, which actually ends for this month in just a few days.

So if I would imagine that most people out there that I'm talking to tonight know about Globe at Night, but if you don't, very, very briefly it's a light pollution monitoring campaign and although that sounds dull, it's not that dull really. It's a lot of fun and so we're going to talk a little bit about what we do in order to participate in that campaign in just a few minutes, but it really does

help scientists and amateur astronomers monitor the conditions in their city or around their city or at their observatory and monitor it over time.

And they can do various things which we'll discuss with that particular data center. So without further ado we're on slide 1 so I want to get to slide 2 before too much time goes by. I hear you have a beautiful scene of Kit Peak National Observatory, it was taken by (Bob Ecdebreshy) who's the founder of the World at Night, which has a lot of landscape astro-photography on that site. So if you haven't seen that you want to go to the twanight.org and look at those beautiful images.

Well I wanted to start out something that I think that you would appreciate and that is some lighting facts that I've taken from the International Dark Sky Association that is actually on the status of world out door lighting, sort of a generalized overview of what the status is at this point and one of the first facts there is that 8% of the total energy used for outdoor lighting, 8% of all total energy is used for outdoor lighting I should say and that 80% is used - of that is used for commercial and public exterior lighting.

So all these facts we have here from the 75 million outdoor lighting fixtures worldwide that comprises 80% and to the 300 million outdoor lighting fixtures that are in Europe and 160 of those, that's 160 million are in the US to the facts about perhaps maybe 60 to 70% of all of that energy that's coming from those fixtures, those lighting fixtures is wasted energy basically.

And there's various breakdowns there, there's about five different categories that the, actually it's the Executive Director has broken this down, he's the Executive Director of the International Dark Sky Association, he labels it as either being unwarranted light or situations where there's over-lighting or perhaps there's no curfew or the lights are not dimmed after a certain time

period or maybe the lights are just have no shielding and are very problematic in terms of glare or again no shielding and have the light totally going upwards.

So he breaks them down into these categories and attributes basically the amount of - or the percentage wise, how much of that 60 to 70% of the light is wasted. Then, and so - then he translates that into the pedi-watts which is 10 to 15 hours annually that is wasted energy and he translates that again, I love this, its into power plants so that's equivalent to about 500 power plants that could light 7.75 million homes basically and produces 750 million tons of CO2 gas.

So a lot of greenhouse gas being tossed into the atmosphere basically that amounts to in terms of pounds and then again just in the United States alone, 110 billion dollars a year, not - world wide a 110 billion dollars a year is wasted approximately. So that gives you sort of an overview of the problem that we have facing us world wide and of course I'm not really going to go over the solutions in this particular talk but everybody I think here knows that most of the solutions center around the fact that you should shield lights and hopefully make them fully cut off so you can't see the light bulb itself and then the other factor would be to use energy efficient bulbs, but that's pretty much a subject for another talk.

And so if you go to slide 3 at this point, this is just an overview that you may want to use in your own talks but light pollution basically affects most of these four areas. We already talked about how it affects energy and cost and how it affects astronomy, you know that all too well. But there are other issues which revolve around how it affects human health and wildlife. And briefly in terms of human health you are influencing the levels of melatonin at night if you have too much light, especially blue light, that depletes your levels of

melatonin and that has direct effects to things like sleep disorders and now ties they believe to a couple different types of cancer.

So it's a very, very - well it's very important in terms of human health and that's again another lecture.

But in wildlife it affects so many different types of wildlife it would just blow your mind to know, from salamanders to frogs to birds to sea turtles to insects to different types of plant life. Too much light at night really disrupts their rhythms, their natural rhythmus of day and night and how that plays into the ecosystem. So that is again a very important influence. So you have all these factors that a simple shield on a light could actually help wonders or using an energy efficient light bulb or both actually is what you want. So just to give you an overview, again those are very important affects that light pollution has on everyday life, not just astronomy.

So what do we do? What can we do to bring more awareness to the public? I consider amateur astronomers as ambassadors of astronomy and as ambassadors of astronomy, forgive me but I really feel that part of the job would be to bring or educate actually the public on issues surrounding light pollution. So one way, one very fun way if you want to say that Globe at Night is fun is to actually introduce the public to Globe at Night and get as many people as you can involved in taking measurements.

So Globe at Night is basically an International System Science campaign to raise the public awareness of the impact of light pollution and you do this by inviting them to measure their night sky brightness and we'll talk about that in just a second. They can use either their eyes, they can use a sky quality meter which we'll introduce you to in a second and also they could use two new apps that we'll talk about as well. So there's four different ways you can use 1, 2, 3,

4 or you know as many of them as you want to, to take measurements and to do that we go to slide number 5.

There's just five very, very easy steps and we actually try to refer them to the website, the website is www.globeatnight.org and you'll find most all of these slides on one of the web pages there on the website. But if you'd like at the top of most of these slides, you will see the exact web page where all this information is coming from and I'm sure that you'll be able to download this for keeps if you want to either as a PDF or a Power Point.

So the five easy starting steps include, first of all just finding your constellation in the night sky and you all know the constellations better than I do I'm sure but the public may not and so we have some easy ways to find the constellation on our web site and we'll mention that in just a second and then we go to try to get them to find the latitude and longitude, which they don't really need to do. They can actually type in their address and we'll show you that in a minute, and that will be enough and that translates into a latitude and longitude.

And we do not keep the addresses at all, and then we ask them after they have these two pieces of information, to go aside about at least one hour, at least one hour after sunset, so it's nice and dark and the moon can not be up, because that's a natural light bulb in the night sky and don't want the moon and then you want to ask them to stay out for ten minutes if they can to acclimated to the night sky, get dark adapted.

After they've done that they can match, they look for Orion say at this point and time and Orion is going to be very, very vivid between 8 and 10 at night this time this month and you simply match what you see towards Orion with seven different charts and pick out which one it resembles, we'll talk more

about that in a second, and then report it online. You can either do it on your computer or if you so choose you use a little web app we call it, it's actually a web page but you can use it with your Smart Phone or Smart device of any sort and take it with you as you observe, I'll talk about that more in a second.

So we have these five basic steps and if you go now to slide 6, you will see that one of our web pages that actually has the five steps on it, also has information on the dates of the campaign, so there's one every month for ten days each month. There's also the constellations that go with that particular campaign, so you can see for instance that for the first three months of the year, if you are in the Northern Hemisphere or the Southern Hemisphere, we suggest that you use Orion, I mean that's actually by default, your sing Orion.

There's not much choice I guess in that, unless you're using your SQM, you're Sky Quality Meter and then for the rest of the month you can see the other constellations listed there. Leo for instance is in April and May for the Northern Hemisphere, while if you're in the Southern Hemisphere it would be (Crocks) for those months.

So that's just an example of what we have there for the different months and you can also, click - if you're on that particular page you can click on the names of the constellations and get the mythologies as well. A lot of the people love to learn about mythologies, I'm one of the those people, I loved stories about the constellations and so you know I'm sure you all use these all the time when you have your Star Parties in getting people to fall in love with the night sky.

So on slide 7, we have also information you have on the website, can you find Orion or it could be any one of the other nine constellations and that's found on the /finding page. You can also click on a link on that page to get the

magnitude charts. But let's first of all go to slide 8 and look at the chart that is for Orion, you can't do it hear, but if you were on your computer you'd be able to take your cursor and go over Orion and see the figure of Orion, the cartoon figure basically, of Orion appear.

And this is good for basically the public if they want to figure out where Orion is in the night sky, you have this tool that they can practice on after they see you they're going to do this on their own and this is just one good affirmation of how to find Orion in the night sky and it's usually done for the middle of the campaign that uses Orion.

So we can't do every single day for every single campaign so we do have to pick and choose which dates and times we do this for and you can see that date and time in the lower middle of the screen, the bottom middle of the screen for each of the constellations. But on the other hand, what's really cool is that on this particular tool you can change your latitude. So for Orion first as it goes from plus 50 or 60 I believe, I think its 60 North down to minus 50, you can actually change all those latitudes by steps of 10 degrees and your sky will look different for that date and time. And you can also change your constellation too. So it's a really nice little tool that we have there.

And if you go the very next slide now, you get into basically the magnitude charts and you can see there this is, if you start with chart one for instance, which is the second one there and you see that it goes from chart one to chart seven basically, magnitude one chart to up to magnitude seven chart, that is precisely, it maps onto basically your limiting magnitude so the faintest star you could possibly see is on that chart. And that's how you measure basically your light pollution level. So the public doesn't necessarily know about magnitudes per say although we try to educate them on the Globe at Night

website, about magnitudes, but even if they don't all they have to do is pick which chart most resembles what they see.

And you try to influence them to pick one where they see the faintest star possible in the night sky and the faintest star possible on the chart and match those up. And once they do that they have chosen their chart for the Globe at Night measurement. So as you can see true to form for light pollution, the lower the number the more light pollution you have in your night sky. So the magnitude 1 is like New York city, the magnitude 7 would be like in your National Park basically and hopefully it's closer to magnitude 7 where you live, it's somewhere in the middle for Tucson.

So if we go now to the chart number 10, you will see that we're starting to talk about reporting your data and that particular report form is what we call the web app and you can see the name of the web page as globeatnight.org/webapp/ and that's where you would report. If you click on, if you're on the home page though, up in the upper right hand corner, it just say report, and you just click on that and it will lead you to the web app page.

So and here you can see that you can do it by Smart Phone, Tablet, Computer, whatever you'd like and we have for instance now on page 11, or slide 11 we have over 20 languages, it's closer to almost 25 I think different languages that we have translated this report page or web app into so that people all around the world can participate and if you go to the very next slide, slide 12, you'll see an example of half of that report page and then we'll show the other half.

But you can see well the really great feature about this report page is that if you have a smart device and you have allowed your smart device to find your location, you kind of have to enable that, it might ask you and you'll say yes

or okay, then automatically your observations will go into number one and number two.

So number one is observation date and time, it will register that automatically you don't need to enter that and number two it'll actually find you and it will show up with that little red balloon thing looking like feature, that dot there that you see on slide 12 directly putting your location directly in that map. And that's really a nice feature, makes it very easy.

If you don not have that working, that's just simply okay, you type in your date and time and for number two you can put in your street address, but again we do not keep any street addresses what's so ever, we do however keep the latitude and longitude and that goes into our database along with your measurements. Once you've put in your location you say, you click map it, it will find it. If you like it below the map there's a little box that says location correct and you'll click on that to make it stay on that particular location and not move, and you're done for your measurements.

Then you go to number three and that is how dark is your night sky? And that'll show your Orion as you see here and you'll have seven or eight choices there down at the bottom. Those are your thumbnail images which you click on to change that big image and so once you click on that one of those thumbnail images and you're satisfied that that is your particular one that you want to choose that matches your night sky the best, that's it, you leave it there you don't have to do anything else.

All right so now we're going to go the next slide and this is the above half of that report page, I couldn't fit everything on there, and basically there's two things you really want to - two or three things you might want to notice, you do want to put your country and for the United States we have that also

divided into states, it should register that automatically if it doesn't it, then please feel free to correct it. And then the second thing you want to notice is the little fun pictures, the cartoon pictures of the clouds. There's a clear option and then its get cloudier as you go to the right. You pick which condition is towards the constellation basically.

And then once you've done that you'll see it highlights it and then you can put in, you don't have to put in comments, but it's totally up to you. If you want to that's great. If you work with a teacher and she wants to put in classroom information, it's great to be able to put it in one of those two comment boxes because she could give her kids a number, like each kid would have a different number and she could say you know, Miss Martin's Class maybe Lovett Texas and number, student number 1, and then she'd know who took what data point for instance.

Then if you have sky quality meters, which are these little card box, playing card box size device that you just press it when you're holding it directly over head, it will give you a digital number that represents a brightness per unit area or typically a magnitude per square x second as you would know it and then you just put in that particular reading and the serial number for that device.

Now the reading should not be taken near a building or a light source particularly because you're trying to get the natural night sky brightness as much as possible as well as the you know, the night sky that's influenced by lighting but not a light fixture basically. So if you can avoid that be as far away from a light fixture or a building as it is high is what we tell people usually.

And then you're ready to send the data, so that's about all there is to it. It's a very simple report form and we hope you'll participate. Now if you're interested in downloading or looking at any of the maps, we have a map page devoted for that. It is called maps.php and it's on slide 14 and you can download it for each of the years.

Right now at the top in the white area in the middle of the page you'll see it says explore the data from the 2014 as it comes in and when you do that, if you go to slide 15, you can see that it would appear like you have in slide 15 with the different polar dots representing how much light pollution, I should say which limiting magnitude that you are looking at for your night sky across the world.

And in this particular case you could also it's not shown here but you can zoom into any location worldwide and take a look what the city their light pollution is like in that particular city that has the data. So and if you know anybody around the world, please advertise and get the word out that they're to take some measurements, that would be great.

Okay so another feature we have is a regional map generator which is really cool because you can actually go to this page, type in an address again, say what radius you want about that address or the center of town or whatever you'd like and then it'll take only those data points and reproduce that map for you and also a CSV file, which is like an Excel spreadsheet and it's wonderful. Teachers love this in particular because then they can narrow it down to just the year that they want for students to look at.

This is also very, very similar to what you can do on the front page, the home page, of the Globe at Night website, because at the bottom of the page there will be a map that is specifically for where your computer is sitting at the

moment and it will be for your, basically your home town and you can with that map at the lower, I think it's the lower left hand corner, they'll be a little link for a CSV you can also just download your data from your area too. So it's really kind of nice, very user friendly in that regards.

Now we've talked enough about the Globe at Night stuff that we usually do but we also have on slide 17 our phone apps and there's two new phone apps and we're very proud to announce these this year. One that's made by our colleagues that are in Germany. They actually got the money and made this app specifically for Globe at Night, which is wonderful. And then we also a second app which is like a meter, like a sky plotting meter but with your phone.

So if we go to the next page it explains about it a little bit more on slide 18, okay so the loss of the night app which is the first of the two I mentioned has you actually using your phone sort of similarly as you would with Star Walk. So you just kind of point in the direction you know where it's asking you to find a star, so that puts a circle around a star you try to find it.

It asks you to do this seven different times and what it's trying to do sequentially is to narrow down the light pollution, living light, the magnitude for the particular night sky that you have by asking you to look at seven different stars. And when it does that it actually can come up with a light solution limit for you, which is very, very nice. And the other app is again like I mentioned, acts like a Sky Quality Meter and if you get the Pro version for only $1.99 it will actually give you a reading.

The two apps, the first loss the night works with Android phones. The dark sky meter app works with I-phone 4 a little bit but better with 4S and 5. So I

would recommend if you have a 4S it'll work much better and in the later models.

Many people ask me okay so what's being done with the data? So on slide 19 you can see some samples of what we're doing with the data, which is really pretty cool. One instance we have meters that are actually stationed, we tried this variation, stationed around Tucson for instance. We're trying to make these projects into projects that students and adults can use worldwide, but we're just in the process of figuring all of this out so we're testing different ideas out.

And one is with these stations that we have, these Sky Quality Meters around Tucson and on observatory mountain tops who've been taking data for over a year now and trying to figure out some variations or some trends in the data with respective time mostly and where they're located. So you have a project that you can see on the left hand side that shows basically in town measurements that you see on the top of the two panels and you can see as the night progresses it gets darker and the four different colors represent four different seasons. The bottom one is actually on places like Kid Peak and other mountain tops where it just is beautiful all night long compared to the city.

And if you could see the measurements, you could see that it's basically like a sky of least (Unintelligible) magnitude 21 at the mountain tops and much, much worse in town so if anyways it's a lot of fun, the projects. I have students working on these kinds of things, so they're producing all this data, which is wonderful. The second project that's there is with bats, we've been trying to do this with wildlife and you can see in the (Squaw National Park) you can see it on the right hand side, that's where they roost, we're not allowed to show you exactly where they roost, but they come out of there at night at

sunset and they travel 25, 30 kilometers across town to an area on the upper, almost left hand portion there you can see the all the tracks of single bats that we've actually tagged and sent with little radio receivers on them.

And then we've taken that data of where they've traveled and matched it with the Globe at Night data, that you can see there and it's very evident that they avoid town. So the question is do we need to protect these bats further? Do we need to protect the quarters further that they travel on?

What are the influences and there's been data reduction done, I could go into that more if you want to but I thing I should move on but it's a very interesting research project and we have now three other wildlife related projects, three different type groups that have approached us and we're working with them this spring to do ones on insects, ones on two different types of animals and one of these projects will actually create another app that you could take and use with Globe at Night data.

So it's going to be really great, I think after this year we'll be able to introduce that next year in 2016 and I'd like to also hopefully by then introduce sort of a user friendly classical user interface I guess they call it or a GUI that people can use with the data sets and have a lot of fun doing research projects. So that's where we are with the data and we have other resources and that's on page 20 or slide 20 various resources you might like to use including our postcards that are shown down slide 20 and we also have those postcards in more than 20lanuages actually so it's been a lot of fun to translate these let me tell you and thank goodness for our translators' worldwide, they do it pro bono and so a good shout out goes to the translators, yeah thank you so much.

And then they're also mentioned in one of our resource pages as well, all the translators. So we have activity guides that you can use if you do not have

readily available a smart device or a computer on hand, you can just take out the pieces of paper that come with your activity guide and take your measurements and then go back in later on and record on line your measurements.

So also the things on the resource page, in fact if you go to slide 21 you will notice we have our downloads in the various languages for the various activity guides, that's just the Northern Hemisphere, that's not all of them so people have been very generous with their time and their efforts in translating all these activity guides because we have one for each constellation for each month, et cetera, et cetera.

And you can see that for slide 22 the activity guide for Orion and that's basically what the first page looks like, it's just the first page and that's the only page with lots of techs, the rest of it there's a couple pages of magnitude charts and then the fourth page has your - what you record your data on, so it's very simple. Well I guess this is the last page shown on 523, sorry about that so here we go that's your report page and you can see again you put in the date, the time, the latitude, longitude et cetera and you choose which chart is best, best matches the night sky.

Okay, so then if that is not enough guys we have more. We have some education activities that you can choose to use if you'd like, if you work with a teacher or you work with the public, there's six different activities that we have made available, you can do things like on slide 24 demonstrating light pollution an shielding, which I bet you most of you do already. We have a city map that you may like to use or the idea of using a planetarium sort of a box and make it into a planetarium, we have all that there for you to download and the way we do it is the activity sheet and or we have things like Constellation

at your Fingertips, which is something that you do not need to use just for Globe at Night.

You could use it in your Star Parties and that involves if a child's (Unintelligible) constellation at arms length, it would so if the stars that pop through little holes in the constellation drawing, she would actually take puffy panes that glow in the dark and trace it onto a transparency and let it dry and you put it under a UV light and low and behold, it glows in the dark naturally for 5 to 10 minutes and you can use it during your Star Parties as well as Globe at Night and there's various other activities here. We have outdoor lighting audit, we have the spectra of lights deals with efficiency's of different types of lights.

The night you hatched deals with gold playing sea turtles and how the light pollution affects them. There's a lot of good little things here. The one about how light pollution affects starts is on teaching the public about limiting magnitudes, so there's a lot of good things here that you may want to look at and our kit, if you are available to take one of our workshops and you commit to the program, because these are expensive kits, on the next page on slide 25 you can see the various things that are in our kits, but the very next slide after that actually it leaves out one of the most important parts which is our light chilling demonstration, but everything starts with that particular activity I think.

So and everybody knows about that I'm sure so slide 27 just shows you our program in action. We have programmed last spring with all of the sixth graders in district 1 in Yuma, Arizona and these are just fun pictures from that particular program using that kit and training the teachers to do the project and that was a lot of fun and then if you go to slide 28 we have last semester and

we're still doing this project, Dark Skies Africa Project, the is with the International Astronomical Union.

They have an office for astronomy for development and they gave out little tiny grants but we were happy to have one and we worked with 12 coordinators from 12 different African countries, most of them from Sub-Sahara in Africa and we had Google Plus hang out sessions and we trained them on these kits and they would train teachers and then worked with the students and we had a blast.

So there's kind of six examples I won't belabor these next six slides but you can see the happy faces from the Algeria is the first one and that's slide 29, slide 30 is from Zambia, slide 31 is form Rwanda, slide 32 is from Tanzania and then the group from Gamma they actually worked through a planetarium. Most of the other teachers were from universities, most of the other coordinators excuse me were from universities and they knew the physics behind everything very well and here's one group from Nigeria that wanted to show off their data from the Lux Meter and the SQM data that we have as part of the kit.

So but now getting back to because I just wanted to show that there's a lot of possibilities here, you can expand in a multitude of directions, but what can you do as amateur astronomers? I would say there's a lot you can do but I have a couple of examples here. You could if you want if you so choose like Norman Oklahoma, yeah, they - the astronomy club there did an extremely wonderful job of taking lots and lots of data one year a few years back, I think it might have been 2009 to took a lot of Globe at Night data, both with Sky Quality Meter data and also with the you know visual Globe at Night data, made maps, presented it to heir city counsel along with some high school students and it took two years, but they got there laws, you know passed to

have ordinances on reducing light pollution levels very successfully and now there's an example for instance from last year, this is a man near Calgary, (Rowland Deshezny) and he took nearly 400 measurements in 400 kilometers, which is amazing so you can bet your bottom dollar that h e spent many nights going up and down certain roads in that area, as you can see from the map and he uses the data also to create dark sky bylaws basically as well as, he does a lot of things actually, this guy is amazing.

But so a lot of things can be done here and then of course there's a planetarium, (Moorhead Planetarium) on slide 36 with (Amy Sale) at Moorhead plus a lot of amateur groups across North Carolina I think it was April 5 last year, as part of Global Astronomy month. They elected to have a Globe at Night Star Party and there were at least 40 Star Party sites across the state of North Carolina which is amazing all in that one night, all dedicated doing Globe at Night, which was wonderful and I would say you know that it doesn't take a whole state, it could be your city, but a Star Party that has people doing Globe at Night measurements and then having that knowledge being able in subsequent evenings to do Globe at Night measurements on their own would be just wonderful.

Because you figure, they go away from your Star Party and they can go to their individual homes, which would be a lot of places across town and they could very easily take more measurements which would cover your town in that instance, so that would be absolutely wonderful and you could be very, very influential in doing that. And then of course if you are really dedicated to this and you want to take the next step forward, we have a program on slide 37 that is called Adopt a Street there's been a few cities that have done this and really enjoyed it and what it is we set up a web page specifically for your city.

What we ask you to do is we have a paragraph or two or three that you get to edit the way you want just set up the instructions that you would you know how you'd like it said and then we ask you to if you can gives us 25 street names and we set that all up for you that looks like this particular page here that we show for Tucson, although not all the streets, we have like 70 street names in Tucson actually, a little bit more than we probably should have, but they're all there for people to choose from and these streets in Tucson, it's like a grid, it runs North, South and so by doing that you're covering the entire city.

What we asked people to do is to adopt a street and then go for the length of the street at every mile or every kilometer whatever they want to do and take a measurement hopefully with SQM's and maybe a digital measurement, at least one or the other and then submit that data on line and if you adopt a street on this particular web page we do not, again we have to honor the (Unintelligible) Laws so we do not take, keep your address at all. All we just note is that those streets has been claimed by somebody and it's yours, your street, no one else will take it and you get to be responsible for that data set just for that street.

So for example, a couple of years ago this is what the Tucson map looked like. You can see the streets running North, South there, all the data that was taken and that was really wonderful, across Tucson, so it makes for a very good way of sampling the data from the city, all over the city, not just all in one point. I have to tell you there is an instance in India where I really appreciate very much that they take all the data, we get no less than 2000 data points from them for the past couple of years, but it's all from one location with 2000 people taking measurements at the same time so you can imagine, that's nice but it's not in long run its not as useful as if you had those 2000

measurements spread out across the town, even if it's at the same time, but you know, but at least spread out at different locations.

Anyways and also you should feel that you can take more than one measurement, as many as you want is just fine and if you need to have an Excel spreadsheet and don't want to upload you know individual measurements. You've taken like 100 measurements or something, I have spreadsheets and I have to put them online soon, but I do have spreadsheets you can download your data, I mean you can type in your data on the spreadsheet and we will upload that for you if you so desire.

So but a just a few more words on various resources that you might want to use that you might be to your benefit if your showing people certain things. For instance on slide 39 every year this wonderful man, this wonderful amateur astronomer has this, there's a special program just for Globe at Night and he does this weekly in any cases for all types of astronomy programs, it's called Eyes on the Sky and he makes little video, you know like a 5 minute or so video pod-cast every week on what's going to be up that particular week in the sky and there's his Utube address for the Globe at Night episode he just recently did for this month and it has a very nice set of instructions.

So like for the first 4 minutes of this 5 minute little episode, he does a very good job if you need to use that in any sense of the word to explain to the public how to do Globe at Night. And then if you want to have some fun for about 9 minutes we have an audio pod-cast that we recently did, actually I gave it to our students, our under-graduate students to make a little skit, we have done maybe seven skits or so of this type where you have a dark sky crusader who comes in and saves the day and he usually addresses issues like how light pollution affects wildlife and he tries to rescue the turtles or something and so we had the students create this really nice, sort of a skit or a

serial skit I should say including a new character called the Dar Night, spelled without the K and it's really cute so they did a great job if you want to ever use something like that that's at your disposal as well and there's the address and then of course we have Face book and we have Twitter pages and those are the links there on slide 41.

We really have a great Face book page and it allows for a lot of interaction between the public and the staff, the Globe at Night staff which is we're not very many people here but anyway so we try to post new things every couple days on there so they interest our members and so feel free to look that over and contribute if you'd like and then on slide 42 we have a world wide contest that is being done with a collaborator of mine who helped me start our Dark Sky (Unintelligible) Program that has evolved into those activities I showed you and the kit and everything.

She lives in :Portugal and she and I, she is the one actually responsible for this contest, she is inviting students and teachers from around the world to come up with a brand new way of fighting light pollution and propose it as part of this contest and the prize will be for anywhere around the world to come to Portugal, I think it's in June next year, and be part of sort of a ceremony for the Dark Skies, I think for designating the Dark Skies Park in Alcava in Portugal. So it's a really, really good nice contest to be able to do so tell your students and your teachers of this idea and have them apply, it's going to be a lot of fun.

Last but not least, I want to mention a project that we had on part of the Board of Directors for the International Dark Sky Association and as part of my duties I get to have fun with the education group of the committee and our task, we have one big task each year that we have to do and last year it was producing a video and a planetarium show called Losing the Dark. Losing the

Dark is only 6 minutes long but it really does very well communicate all the effects, the bad effects of light pollution and how we might be able to regress the situation and so for your use as either a planetarium show or a dark sky video, it's absolutely free, you can either go to the Utube address there or if you so desire you can go to the darksky.org web page, that's the International Dark Sky Association web page, again darksky.org, and they have a few, if you search for downloads losing the dark, you will come to the right web page for this particular you know video to download.

So it comes in various formats, so you can pick the format that best fits you, you know high or low resolution or whatever it may be for different kinds of computers. So everything's been so well thought out and right now that particular video is in 12 different languages, so it's really again a very nice resource to have on hand.

So it's been 45 minutes and I think oh my good, I'm sorry, oh my goodness it's been 45 minutes, I'm sorry. Well that's it for me I just didn't know if you can open it up now and see if we have questions and the last slide is just my contact information so and that's it.

(David Prosper): Thank you so much (Connie) that was awesome and we're totally stoked to help support your fine effort to educate people about light pollution and dark skies. Yes it looks like we still have time for a couple questions so let's open up the lines to our listeners, operator if you could let them know how to call in.

Coordinator: Absolutely, if you would like to ask a question please press Star 1, un-mute your phone and record your name clearly. If you need to withdraw your question, press Star 2, again to ask a question please press Star 1. All right we have one question from (Stewart Myers), (Stewart) your line is open.

(Stewart Myers): Okay, thanks for the presentation.

(Connie Walker): Hi (Stewart).

(Stewart Myers): Hi, I was just saying you I want to complement you on the presentation and you may or may not remember that I've been trying to since my local church is on this sort of an environmental thing, I've been working on getting them interested in light pollution and the thing is there going to be doing an education thing. They're going to be setting up this sort of an environmentally oriented pre-school program and I've been trying working a bit behind the scenes to try to get some light pollution involved in it and I was wondering which of the activities on your thing you think would be best suited to a pre-school audience.

(Connie Walker): Wow, pre-school is pretty young but I think we could something here. First I would probably have to talk to our finest to how, you know what language to possibly use to just show them some very simplified version of the light shielding demo because you need a tiny bit of introduction to it that way and then I would do the turtle on the night you hatch, the turtle hatching role play activity and that would be a lot of fun for them I think. So those two things I think would be the best.

(Stewart Myers): All right, okay just making some notes of it.

(Connie Walker): And we can, I'd be happy to talk with you off line too in more detail about that so feel free to call my office if you want to.

(Stewart Myers): All right or I can email would that work to?

(Connie Walker): Yes but you know talking is nice.

(Stewart Myers): All right I'll see and look into when I need it, it took me quite a while just to get them interested in light pollution. It took me about just 2 years just to get them interested.

(Connie Walker): Well congratulations.

(Stewart Myers): Yes, they got them into a Globe at Night and I don't how many of them actually made, many of the people in the congregation made observations and I did illustrate it, they also go to see the City Dark.

(Connie Walker): Good.

(Stewart Walker): Well all right.

(Connie Walker): So where are you from (Stewart)?

(Stewart Myers): East Brunswick in Jersey.

(Connie Walker): New Jersey okay.

(Stewart Myers): Yes we based in previous, the limiting magnitude around where I live is somewhere a little over, somewhere near four and half.

(Connie Walker): Oh that's not too bad.

(Stewart Myers): No, all right.

(Connie Walker): Well thank you (Stewart).

(Stewart Myers): You're welcome.

(David Proser): All right bye and thank you and actually we're coming up near the end of our a lotted hour so it we're going to have to, it will be our last question for the teleconference however, you can contact (Connie) directly at here email which she's kindly given out at the end of her presentation, so thank you again. And there's one more thing before we sign off is let's have a drawing for our prize, the signed copy of How it began as well as, wait actually just that this time. Operator can you let us know how to do that, we'll take the lucky seventh caller.

Coordinator: Yes if you want to press Star 1, we'll take the seventh one then, press the Star 1.

(Connie Walker): So I'm positive I can't try right?

(David Proser): Oh yes we can just ask (Chris) for it.

(Connie Walker): It be easier to cross the street.

Coordinator: All right your seventh person was (John Hazley).

(David Proser): (John) awesome congratulations on your winner. You have won the e-free copy of the book signed by the esteemed (Chris Empay) and thanks again and I d' like to thank Norton Books again and the ASP for donating our prize for tonight and again I would like to extend another thanks to (Connie) and the Globe at Night program for joining us for this incredibly awesome and fact filled information rich presentation. I hope everyone follows up and help join

the fight against light pollution in your area and take care everyone and have an awesome night.

(Connie Walker): Well thank you.

Coordinator: Thank you that concludes today's conference you may disconnect at this time.

END